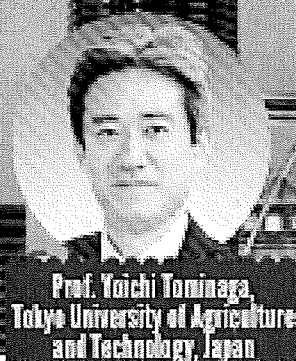


# ICAMME 2019

4TH INTERNATIONAL CONFERENCE ON  
ADVANCES IN MANUFACTURING AND  
MATERIALS ENGINEERING

30-31 OCTOBER 2019 PICC, PUTRAJAYA

OUR KEYNOTE SPEAKERS:



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Center of Knowledge and Values



# **Effect of SiC particle size on hardness and wear behavior of TIG melted hard surface layer AISI Duplex-2205 Steel**

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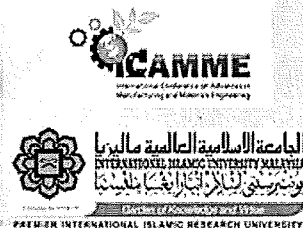
*\*Corresponding author: maleque@iium.edu.my*

The formation of hard surface layer on AISI Duplex-2205 steel provides a protective coating against wear application. In the present work, SiC particle size with average sizes of 20  $\mu\text{m}$ , 60  $\mu\text{m}$  and 100  $\mu\text{m}$  were used as surface preplacement to AISI Duplex-2205 surface. The purpose of the study is to evaluate the influence of different SiC particle size melted at heat input of 768 J/mm on hardness and wear behavior. The surface characterization, hardness and wear behavior were conducted using scanning electron microscopy, Vickers micro-hardness and reciprocating wear tester respectively. Characterization of the TIG melted layer reveals the existence of new phases containing a dendritic structure. The surface hardness developed 4 to 6.5 times higher than substrate hardness (250 Hv) depending on the dendrite population. The SiC particle size of 100  $\mu\text{m}$  produced lower friction value of 0.37 and wear rate of  $2.3 \times 10^{-6} \text{ mm}^3/\text{Nm}$  compared to  $3.2 \times 10^{-6} \text{ mm}^3/\text{Nm}$  for 20  $\mu\text{m}$  particle size. The improvement of wear properties is correlated well with the increased hardness value of TIG melted hard surface layer AISI Duplex-2205 steel.

**Keywords:** SiC particle size, Duplex-2205 Steel, TIG torch, hardness, wear rate.



Organized by



Date: 21 June 2019

Our Ref: ICAMME2019-105

Lailatul Harina Paijan

Effect of SiC particle size on hardness and wear behavior TIG melted hard surface layer AISI Duplex-2205 Steel

lailatul.harina@gmail.com

Dear Lailatul Harina Paijan;

**ICAMME2019: NOTIFICATION OF ACCEPTANCE LETTER**

**Paper Entitled: Effect of SiC particle size on hardness and wear behavior TIG melted hard surface layer AISI Duplex-2205 Steel**

With reference to the above matter, we are pleased to inform you that your paper has been accepted for oral/poster presentation in International Conference on Manufacturing and Materials Engineering on 30 – 31 October 2019 at Putrajaya International Convention Center, Malaysia. Details of the conference can be accessed at <https://conference.iium.edu.my/icamme/>.

Kindly prepare your full paper according to the format International Journal of Recent Technology and Engineering (IJRTE). The template of the format can be found on the ICAMME 2019 website <https://conference.iium.edu.my/icamme/>. All accepted papers of ICAMME 2019 will be published in a Special Issue of IJRTE which is indexed by SCOPUS.

For the conference fees, early bird participant is required to pay RM 1312 and RM 1600 for normal participants. Please visit the <https://epayment.iium.edu.my/econference/econferences/add/325> for the details of payment method. A separate invoice will be sent to your email on a later date. Kindly send to us the proof of payment once the payment is completed. Please note that all presenters must register for the conference and pay the registration fee before the deadline. If you do not register, you will not be allowed to present and your paper will not appear in the printed Programme Book.

On behalf of the Organizing Committee, we thank you for your participation in ICAMME2019 and we look forward to seeing you in the conference. Should you have any inquiry, please do not hesitate to contact the Chairman, Dr. Mohamed Abd Rahman, +603 6196 5785 or via email to [icamme@iium.edu.my](mailto:icamme@iium.edu.my).

Thank you and best regards,

Dr. Mohamed Abd Rahman

Chairman, ICAMME2019

ICAMME2019 Secretariat,  
Department of Manufacturing and Materials Engineering, Faculty of Engineering, International Islamic University Malaysia,  
53100, Gombak, Selangor.

## IEC'19 PROGRAMME

Day 1: Wednesday 30 <sup>th</sup> October 2019			
08.00 - 09.00	Registration		
9.00 - 9.45	<b>Congress Keynote Speaker #1</b> Title: <b>Triggering Physiological Micro/Nano Mechatronics for Respiratory Treatments</b> Name: Professor Dr. Ahmed Al-Jumaily Venue: Ball Room 1 Chairperson: Prof. Dr. Md. Raisuddin Khan		
9.45 - 10.30	<b>Congress Keynote Speaker #2</b> Title: <b>Novel Ion-Conductive Polycarbonate-based Electrolytes for Battery Applications</b> Name: Professor Dr. Yoichi Tominaga, Tokyo University of Agriculture and Technology (TUAT) Venue: Ball Room 1 Chairperson: Prof. Md. Abdul Maleque		
10.30 - 11.00	Tea break		
11.00 - 11.50	Opening Ceremony		
11.50 - 12.35	<b>Congress Keynote Speaker #3</b> Title: <b>Novel Revolutionary Materials and Devices for Solar Energy: Hybrid Perovskites</b> Name: Prof. Dr. Anvar A. Zakhidov, Physics Department & Nanotech Institute The University of Texas at Dallas Venue: Ball Room 1 Chairperson: Assoc. Prof. Dr. Raihan Othman		
12.35-13.20	<b>Congress Keynote Speaker #4</b> Title: <b>Image Analysis Using Persistent Homology</b> Name: Prof. Dr. Mohd. Salmi Md. Noorani, School of Mathematical Science Universiti Kebangsaan Malaysia Venue: Ball Room 1 Chairperson: Dr. Mohd Lukman Inche Ibrahim		
13.20 - 14..20	Prayer and lunch break		
14.20 - 17.00	Parallel Sessions		
	ICAMME'19 (1)	ICAMME'19 (2)	ICAMME'19 (3)
	ICOM'19 (4)	ICOM'19 (5)	ICOM'19 (6)
	ICMAE'19 (7)	ICMAE'19 (8)	ICMAE'19 (7)
17.00-17.30	Prayer and Refreshment		
Day 2: Thursday 31 <sup>st</sup> October 2019			
9.00-9.50	Conference Keynote Sessions		
	ICOM'19 Keynote 2	ICAMME'19 Keynote 2	ICMAE'19 Keynote 3
9.50- 10.20	Tea break		
10.20 -13.00	Parallel Sessions		
	ICAMME'19 (1)	ICAMME'19 (2)	ICAMME'19 (3)
	ICOM'19 (4)	ICOM'19 (5)	ICOM'19 (6)
	ICMAE'19 (7)	ICMAE'19 (8)	ICMAE'19 (9)
13.00-14.00	Prayer and Lunch break		
14.00-16.40	Parallel Sessions		
	ICAMME'19 (1)	ICAMME'19 (2)	ICAMME'19 (3)
	ICOM'19 (4)	ICOM'19 (5)	ICOM'19 (6)
	ICMAE'19 (7)	ICMAE'19 (8)	ICMAE'19 (9)
16.40-17.00	Best papers Awards Ceremony		
17.00-17.30	Prayer, Refreshment and End of Congress		

DAY 2, THURSDAY, 31 OCTOBER 2019			
ICAMME'19 Keynote Session, Thursday, 31 October 2019: 9.00 – 9.50			
<p><b>Keynote Speaker 1:</b> Prof. Dr. Che Hassan Che Haron – University Kebangsaan Malaysia <b>Title:</b> Sustainable Machining of Inconel 718 Alloy: Dry, MQL and Cryogenic Cooling</p> <p><b>Chairperson:</b> Prof. Dr. Erry Yulian Triblas Adesta <b>Venue:</b> Hall 2</p>			
9.50 - 10.20	Refreshment		Venue: Foyer (Hall 2, 3 and 4)
Parallel Technical Sessions 2, Thursday, 31 October 2019: 10.20 – 12.20			
Time	<p><b>Chairperson:</b> Assoc. Prof. Dr. Mohd Hanafi Ani <b>Co-Chair:</b> Dr. Alya Naili Rozhan</p> <p><b>Venue: Hall 2A</b> <b>(ADVANCED &amp; SUSTAINABLE MATERIALS)</b></p>	<p><b>Chairperson:</b> Assoc. Prof. Dr. Mohd Radzi Che Daud <b>Co-Chair:</b> Dr. Natasha A. Raof <b>Venue: Hall 2B</b> <b>(SMART MANUFACTURING)</b></p>	<p><b>Chairperson:</b> Dr. Nor Farah Huda Abd. Halim <b>Co-Chair:</b> Dr. Suhaily Mokhtar <b>Venue: Hall 2C</b> <b>(SIMULATION, MODELLING &amp; MANAGEMENT)</b></p>
10.20 – 10.40	<p>Paper ID: 158 Early Investigation in Porous Aluminum Development via Powder Metallurgy Technique</p>	<p>Paper ID: 161 Effects of Drilled Area Temperatures on Drilling of NFRP Composites: A Review</p>	<p>Paper ID: 173 Adapting the LTE Architecture to 5G: Challenges and Possibilities</p>



11.40 – 12.00	<p>Paper ID: 105 Effect of SiC Particle Size on Hardness and Wear Behavior TIG Melted Hard Surface Layer AISI Duplex-2205 Steel</p> <p>Lailatul Harina Pajjan, Md Abd Maleque and Suryanto Malaysia</p>	<p>Paper ID: 178 Mechanical and Structural Properties of the Butt Welded Joint in High Strength Structural Steel (ST52-3) Using Gas Metal Arc Welding and Oxyfuel Gas Welding</p> <p>Tasnim Firdaus Mohamed Ariff and Osamah Omar Alqwairi Malaysia</p>	<p>Paper ID: 172 The Performance Analysis of PID Controller for Rehabilitation by Using Dynamic Model</p> <p>Rupal Roy, MM Rashid, Maidul Islam, Julkar Nayen, Anik Paul and Norsinnira Zainul Azlan Malaysia/Bangladesh</p>
12.00 – 12.20	<p>Paper ID: 176 Anodized Nano-coating of Copper Material for Thermal Efficiency Enhancement</p> <p>M H Mahmood and M A Maleque Malaysia</p>	<p>Paper ID: 127 Investigation on Pullout Strength between Different Design of Cannulated Pedicle Screw and Osteoporosis Bones to Obtain an Optimum Design</p> <p>Rosdi Daud, Muhammad Amir Asyraf Abdul Mubin, Mas Ayu Hassan, Arman Shah and Siti Haryani Tomadi Malaysia</p>	
13.00 – 14.00	<div>Lunch Break</div> <div>Venue: Pot and Pan Restaurant</div>		
Parallel Technical Sessions 3, Thursday, 31 October 2019: 14.00 – 15.20			
Time	<p>Chairperson: Assoc. Prof. Dr. Hadi Purwanto Co-Chair: Dr. Norhuda Hidayah Nordin</p> <p>Venue: Hall 2A (ADVANCED &amp; SUSTAINABLE MATERIALS)</p>	<p>Chairperson: Dr. Shafie Kamaruddin Co-Chair: Dr. Nor Khairussihma Muhammad Khairussaleh Venue: Hall 2B (SMART MANUFACTURING)</p>	<p>Chairperson: Assoc. Prof. Dr. Maizatunlisa Othman Co-Chair: Dr. Syazwani Mohd Zaki Venue: Hall 2C (ADVANCED &amp; SUSTAINABLE MATERIALS)</p>
14.00 – 14.20	<p>Paper ID: 128 Thermal Oxidation Promotes Growth of Nanocrystalline Diamond on Biomedical Grade Co-Cr-Mo Alloy</p> <p>H. Mas-Ayu, S Izman, Rosdi Daud, A. Shah, Siti Haryani Tomadi and M. S. Dambatta Malaysia</p>	<p>Paper ID: 139 Integrating TRIZ (Theory of Inventive Problem Solving) Into Value Analysis Value Engineering (VAE) Methodology</p> <p>Ainul Farahin Abdullah Malaysia</p>	<p>Paper ID: 148 Performance of Nano Silica as Modified Binder to Improve Rutting and Fatigue Resistance</p> <p>Khairil Azman Masri, Ahmad Kamil Arshad, Ramadhansyah Putra Jaya, Haryati Awang, Mohamad Idris Ali, Ekarizan Shaffie, Juraidah Ahmad And Youventharan Duraisamy Malaysia</p>

Parallel Technical Sessions 1, Wednesday, 30 October 2019: 14.00 – 16.30			
Time	Chairperson: Prof. Dr. Iis Sopyan Co-Chair: Dr. Noorasikin Samat  Venue: Hall 2A (ADVANCED & SUSTAINABLE MATERIALS)	Chairperson: Assoc. Prof. Dr. Tasnim Firdaus Mohamed Ariff Co-Chair: Dr. Siti Haryani Tomadi Venue: Hall 2B (SMART MANUFACTURING)	Chairperson: Dr. Ahmad Zahirani Ahmad Azhar Co-Chair: Dr. Nur Ayuni Jamal Venue: Hall 2C (ADVANCED & SUSTAINABLE MATERIALS)
14.00 – 14.20	Paper ID: 104 Impact and Fire Resistance Properties of Polypropylene Filled with Graphene/Mg(OH) <sub>2</sub> Nanoparticles  <i>Ruey Shan Chen and Sahrim Ahmad Malaysia</i>	Paper ID: 137 Burr Control Using Modified Tool Geometry: A 3D FEM Approach  <i>Muhammad Asad Saudi Arabia</i>	Paper ID: 134 Study of Surface Modification on Die-Casting AZ91D Magnesium Alloy  <i>Fatin Shaera Zuhari, Nur Liyana, Rozie Nani Ahmad and Siti Norbadiyah Mohamad Badari Malaysia</i>
14.20 – 14.40	Paper ID: 171 Study on Physicochemical Status, Bacterial Analysis And Its Correlation  <i>MN Uddin, Z Mahabub, MM Rahman, MR Rana, N Haque, MS Islam, S Ahammed, Rupal Roy and MM Rashid Bangladesh</i>	Paper ID: 123 Optimum Surface Roughness, Tool Wear and Cutting Force for Titanium Alloy In Turning Process Using Taguchi Method  <i>Razali Samin, Nurhidayah Azman, Mohd Zaki Nuawi, Sallehuddin M. Haris and Jaharah A. Ghani Malaysia</i>	Paper ID: 140 Effect of Nano-CuO Grain Size on Heat Transfer Performance of Copper Substrate  <i>M H Mahmood, Md Abdul Maleque and Suryanto Malaysia</i>
14.40 – 15.00	Paper ID: 162 The Production and Characterization of Lanolin and Polylactic Acid Based Nano Structures for Wound Management  <i>Muhammet Uzun and Hüseyin Oymak Turkey</i>	Paper ID: 144 Real Time Implementation of Intelligent Controller for the Control of Cement Dust Emission in Wet Scrubber System  <i>Sambo Aliyu Umar, Adamu Yawale Babawuro and Md. Raisuddin Khan Nigeria/Malaysia</i>	Paper ID: 141 Development of Abradable Coating on Steel Substrate by High Velocity Oxy-fuel (HVOF) Method  <i>Raden Ramdan, Budi Prawara, Irma Pratiwi, Syauqi Ramadhan, Bambang Widyanto and Rochim Suratman Indonesia</i>
15.00 – 15.30	Break		